

Materials Education Sans Frontières

International UG and PG Exchange Programmes



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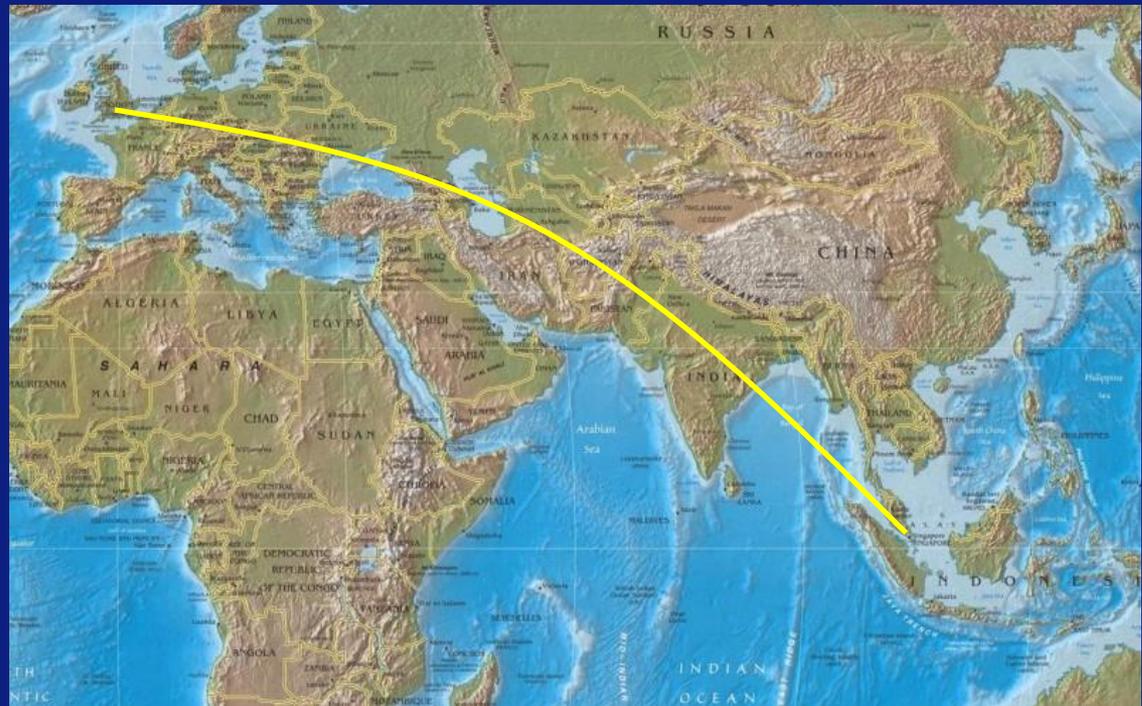
NUS, NTU (Singapore) and Universiti Sains Malaysia (USM)

(PMI2 funded projects)

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Contents

- Define Research Questions
- The Context - Imperial College and NUS/NTU/USM
- UG schemes
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Research Questions

Evidence Based Curriculum Developments

“Are overseas student placements beneficial ?”.

- Does an international placement improves admission statistics?
- Do those students that go on international placements perform “better” than control groups that do not ?
- Do these students benefit in terms of employability ?
- Are there other benefits ?
- Has anybody attempted to quantify these benefits ? (EBCD)



The Context

Globalisation



“Science is a truly international activity” - Harry Kroto

Undergraduate level

- UROP programmes for students at UG level
- MEng placement (between yr3 and yr4)
- Block placements for UG students (i.e. year abroad)

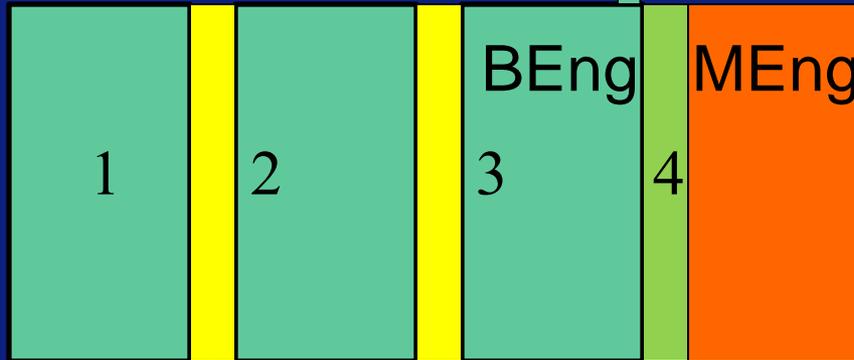
Postgraduate level

- Short visits / lab placements for PhD students (i.e. PMI2)
- Formalised schemes such i.e. PhD programs (NUS/NTU/USM & Imperial)

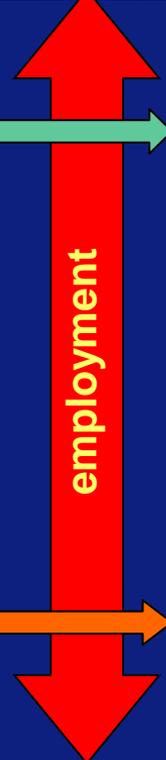
Materials Degrees at Imperial College



Maths & Physics 'A'
English required
31% overseas
SE Asia
/China



Summer exchange programmes



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UROP Programmes

- To offer students the opportunity to undertake a funded 'not-for-credit' placement at a host institution overseas, during their long summer recess at the end of the second or first year.
- Competitive - academic merit and ambassadorial skills critical
- Students are increasingly keen to take such courses
- Two-way schemes

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UROP and MEng Placement Scheme

Possible Benefits

- (i) improved performance in the course, especially in coursework
- (ii) experience of new experimental techniques
- (iii) experience of working with people from different countries and thus enhancing socialisation
- (iv) improved personal strength (becoming more confident in communication and etc)
- (v) improved project management skills
- (vi) improved employability (CV polishing)
- (vii) a high conversion rate into PhD students
- (viii) step-changes in enthusiasm and motivation
- (ix) step-changes in maturity and in professional approach to work
- (x) better time management skills
- (xi) personal development
- (xii) improved research links for the academic staff involved.

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UROP Scheme

Finance

UROP student in London requires £ 190 per week and travel costs have to be added, so for an London-Singapore eight week project the cost is ~ £2K

Funding streams:

Contributions from research grants

Contributions from companies

Student grants from “Worshipful Companies”, particularly the Armourers and Brazier’s, The Ironmongers and the Tin Plate Workers

The Nuffield Foundation

The Imperial College UROP office and NUS IRO office

Numbers

From Imperial Materials 10 students to six universities (10%)

Imperial College UG exchanges

Developing Strategies to Test the Perceived Benefits

- Sample of 14 students out of 238 (6%) who did UROP
- They got 20% of the first class degrees (10% norm).
- Average mark of 73% throughout the course.
- No step change in coursework, exam grade, or group assignment.
- BUT 66% went on to do PhDs.
- The people we have sent on placement were the stars in their class all along, so the possibility they had to improve their performance from the already high level they were at was limited
- The UROP scheme opened their eyes to research and gave them the confidence to pursue careers in engineering and science

NUS UG exchanges

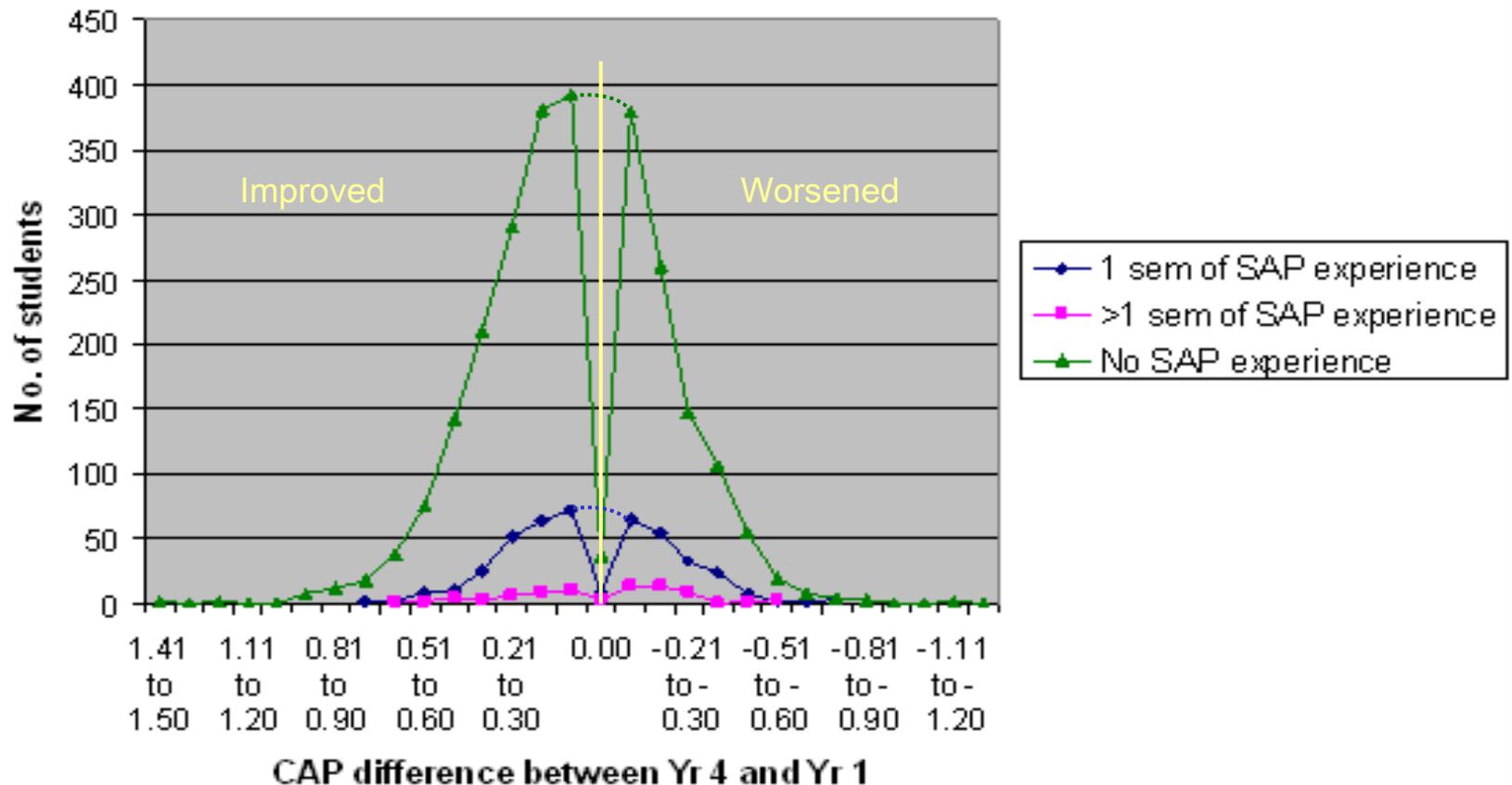
Developing Strategies to Test the Perceived Benefits

- Compared Student performance between semesters 1 and 2 and semesters 7 and 8
- Three groups
 - No overseas experience
 - Less than one semester overseas
 - One of more semesters overseas
- No systematic difference in degree performance
- Also no improvement in PhD recruitment
- Thanks to Andrew Wee, Roland Su and Li Ling

NUS UG exchanges

Developing Strategies to Test the Perceived Benefits

Comparing academic performance of students (graduated with Honours from AY04/05 to AY08/09) with and without overseas experience



UROP Student Exchanges

UROP Scheme

Student Anecdotes

“I did a placement after my first year. It was in Columbia, Missouri in the summer of 2000. I still refer to it as my time abroad and the experience will stay with me for life. It also really helped me understand American culture and mentality in a way I would never otherwise have appreciated.”

“Lehigh was the first foray into the world of academic research for me. Although the project I worked on was not in my area of specialisation, I found it and the challenges it brought interesting and informative. It taught me many things that simply attending lectures and laboratory classes could never teach. It enhanced the confidence I had in my own scientific and experimental abilities, and showed that I was able to adapt and work well in an unfamiliar environment. The knowledge and skills I acquired at Lehigh were an invaluable first step in my personal and professional development as an engineer. “

UROP Student Exchanges

UROP Scheme

Staff

“Increased international exposure is critical in today's global economy. This can translate to benefits for future employers of the student, i.e. opens up opportunities either within academia or even within industry who are becoming more global in terms of their transactions and operations. For example we have a company here that has branches in England and India! This type of experience even with relation to the culture is highly valued as I have been told by one of the managers in this large company.”

“Most importantly giving the student a sense of adventure and excitement, that breaks away from the routine of regular degrees.”

“I can tell you that one of my students who went to IC, came back and gave a seminar and he was simply ecstatic.”

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UROP couple



Their UROP baby

UROP schemes

- Do not produce a step change in academic grades
- Do lead to a high conversion rate into PhD students
- Strengthen even further the morale and motivation of a highly engaged group of students
- Are undertaken by enthusiasts and managed by enthusiasts
- Measuring the effect of educational interventions is an interesting challenge
- Can lead to unexpected results

International PG Student Exchanges

PMI2 scheme

NUS (Cameca SIMS)



IMRE
(Ion TOF SIMS)

Imperial College
(FIB SIMS + Titan TEM)



Collaborative PhDs – international programmes

At Imperial College London our researchers are not only leading experts in their fields, they also collaborate with top international experts from other leading institutions around the world, in order to further research of global importance.

Imperial's collaborations with other world class universities give our PhD students the opportunity to benefit from a truly international experience, working with two teams of experts on one exciting PhD research project.

On the reverse are details of our international joint awards, and of Imperial awards which provide the opportunity for study abroad.

All PhD study is dependent on finding suitable supervisors.

Joint PhD programmes

The University of Hong Kong (HKU) and Imperial College London Joint PhD Award

- Offered in all subjects across the College from September 2010
- Time spent equally at Imperial in London and HKU in Hong Kong
- Three or four year research programme
- One PhD certificate will be awarded jointly by both institutions

www.imperial.ac.uk/hku

Nanyang Technological University (NTU) and Imperial College London Joint PhD Award

- Offered in some engineering subjects
- Four year programme – up to two years can be spent at each institution
- One PhD certificate will be awarded jointly by both institutions

www.imperial.ac.uk/ntu

National University of Singapore (NUS) and Imperial College London Joint PhD Award

- Offered in all subjects across the College from August 2010
- Time spent equally at Imperial in London and at NUS in Singapore
- Three or four year research programme
- One PhD certificate will be awarded jointly by both institutions

www.imperial.ac.uk/nus

Imperial PhD awards with international experience

A*Star Imperial Doctoral Programme (A*Star)

- Available to Singaporeans or ASEAN nationals; students are fully sponsored and approved by A*Star before applying to Imperial
- Four year PhD programme (two years spent at Imperial and two years at A*Star)

• PhD awarded by Imperial

www.imperial.ac.uk/aip

King Mongkut's Institute of Technology Ladkrabang-Imperial Doctoral Programme (KIDP)*

- Three year PhD programme (12 months spent at Imperial)
- Available to students through KMITL
- PhD awarded by Imperial

www.imperial.ac.uk/kmitl

Malaysia-Imperial Doctoral Programme (MIDP)

- Available to Malaysian students through five top Malaysian institutions (UKM, UM, UPM, USM, UTM)
- Three year PhD programme (12–18 months spent at Imperial)
- PhD awarded by Imperial

www.imperial.ac.uk/midp

* Subject to Imperial College London Senate approval.

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PhD level exchanges

- Provide access to complimentary equipment and expertise
- Provide access to different cultural approaches to the research process and to improved awareness of different cultures
- Provide improved social and cultural understanding
- Improved employability through networking
- Development of a methodology to determine the benefits is challenging

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Conclusions

- Science is a truly international activity and scientists have to “go global”
- International placements have many benefits for UG and PG students, and for the academic staff involved
- Some of these benefits are immediate, some will not be apparent for many years
- Many of these benefits cannot be measured quantitatively

